



IV. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

A. Land Ownership or Land Jurisdiction

Lands within the I-17 project area consist of public and private lands. Private lands in the project area are within the jurisdictions of the City of Phoenix and Maricopa County. Publicly owned lands in the project area predominantly consist of State Trust Land under the jurisdiction of ASLD, as approximately half of the project area is located adjacent to ASLD land. Other public lands along the project area are owned by:

- Bureau of Land Management (BLM) (Ben Avery Shooting and Recreation Area, which is managed by Arizona Game and Fish Department [AGFD])
- City of Phoenix
- Flood Control District of Maricopa County (FCDMC) (Skunk Creek floodway)
- Bureau of Reclamation (BOR) (CAP Canal)

B. Land Use

1. Existing Conditions

Existing land uses consist of a mixture of commercial, residential, recreational, and undeveloped lands. The southern section of the project area, which includes the areas from Happy Valley Road to SR 101L, is mostly urban and densely developed. The northern section of the project area, which includes the area from Happy Valley Road to New River Road, is largely undeveloped and rural in nature and is comprised mostly of grazing lands. Residences and commercial properties are present in the Anthem and New River areas. This area is growing and an increasing number of residential and commercial properties are becoming established.

2. Land/Access Rights Acquisition

The preferred alternative would require the acquisition of 60.1 acres of new R/W (Table 5) on 148 parcels. This would consist of 17.0 acres of undeveloped public lands and 43.1 acres of private land. Most of the affected property consists of undeveloped lands or property on which buildings or facilities are planned but have not yet been constructed. The lands affected include industrial properties, commercial and office lands, and residential property. In the majority of cases, the new R/W would consist of a strip of land adjacent to I-17 or the adjoining frontage roads, but the entire parcel would not be acquired and improvements on the parcel would not be displaced. Several commercial areas where trailers are sold, serviced, and/or stored on the property would be affected, although the entire use would not be displaced. Individual displacements are addressed on page 47.

The ADOT R/W Group researched warranty deed information to determine what access rights to the existing frontage roads are held by adjacent property owners. They found that of 21 property owners, nine have clear rights to access to a two-way frontage road, and eight warranty deeds contain language that could be construed to imply access to a two-way frontage road. Converting two-way frontage roads to one-way operations, as is proposed under the preferred alternative,



would require an acceptable alternate access route and would likely include the purchase of access rights from these property owners.

Table 5 – New Right-of-Way Requirements

Property Owner	Acres of New R/W
Private	43.1
ASLD	12.4
City of Phoenix	2.3
BOR	1.3
FCDMC	0.9
APS	0.1

Some properties would experience enhanced access due to proximity to proposed cross streets, others would not have any change in value, and others would be negatively affected by the change in access. It is anticipated that the R/W would not be purchased for five years. Any loss in value to property owners, due to property takings or change in access rights, would be compensated, in accordance with all applicable federal and state laws.

3. Conclusion

In conclusion, the preferred alternative would minimize impacts to adjacent land use by widening to the inside of the existing I-17 lanes, minimizing R/W take from adjacent properties, maintaining access to adjacent properties, and accommodating traffic volumes associated with future land development in the project area. Therefore, the preferred alternative would have no substantial impact on land use in the project vicinity.

C. Water Quality

1. Floodplain

The project was evaluated for potential impacts to the floodplain upstream and downstream of I-17, in accordance with Title 23 of the Code of Federal Regulations (CFR), Part 650, Subpart A, which prescribes FHWA policies and procedures for the location and hydraulic design of highway encroachments on floodplains. This regulation calls for the assessment of federally funded highway projects in terms of impacts on flood risk. Under this code, federal highway projects must avoid hazardous or incompatible use and development of floodplains; avoid longitudinal or substantial floodplain encroachment; minimize negative impacts on base flood elevations; restore and preserve natural and beneficial floodplain values; and be consistent with Federal Emergency Management Agency (FEMA), state, and local government standards for administration of the National Flood Insurance program.

As documented in the project's drainage report (ADOT 2002e), the FEMA Flood Insurance Rate Map panels for the project area show that the 100-year floodplain extends across the project area at Scatter Wash, Skunk Creek, CAP Canal, Deadman Wash, and the New River (Figure 9). In addition, Scatter Wash, Skunk Creek, and Deadman Wash have also been designated as

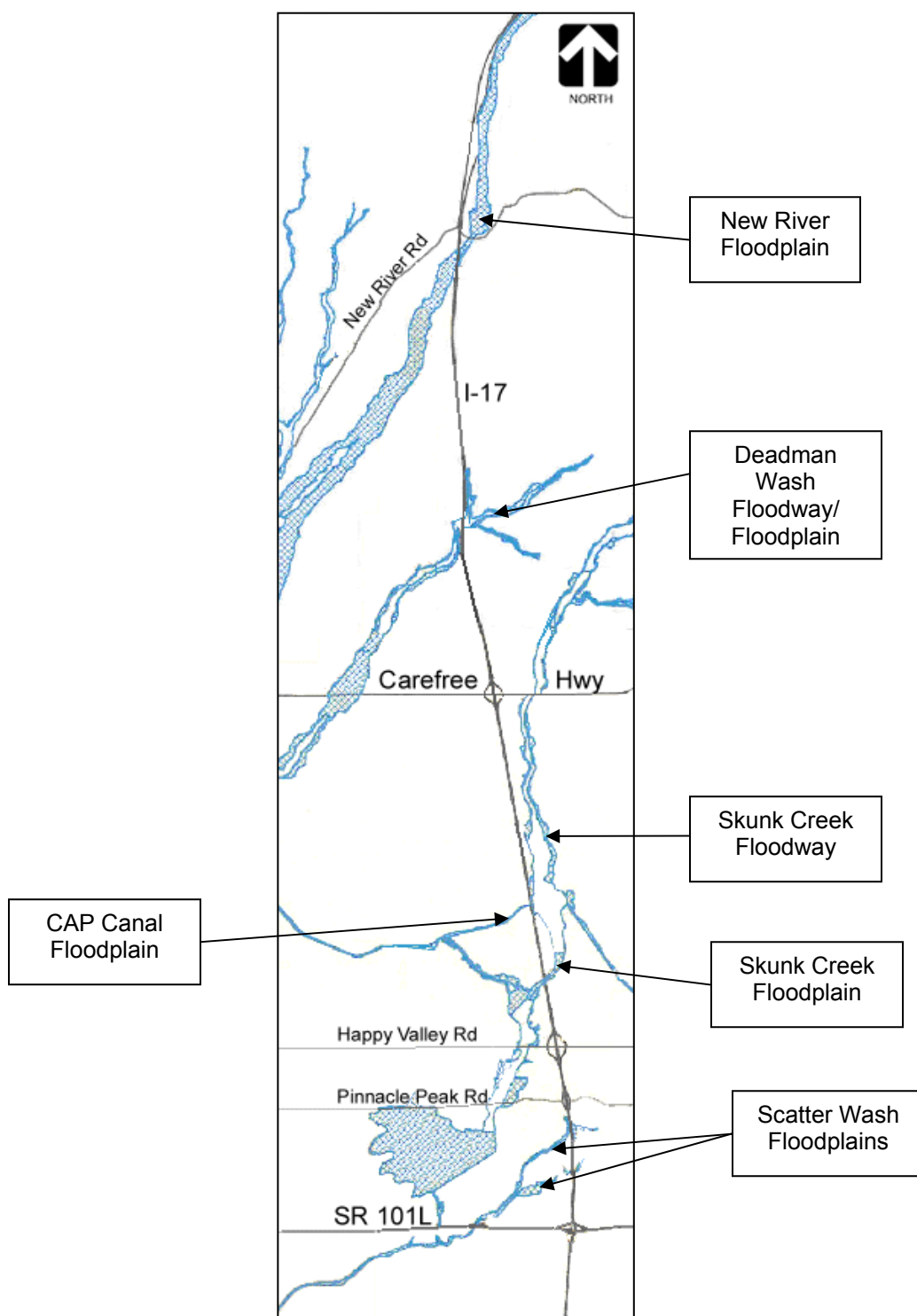


Figure 9 – 100-Year Floodplain and Floodways



floodways, where the cross-sectional flow cannot be obstructed so as to cause an increase of 1.0 ft or greater in the water surface elevation of the watercourse. Skunk Creek passes under I-17 within a concrete levee structure. The floodway along Skunk Creek also abuts the east side of I-17 for 1,200 ft near the CAP Canal crossing. The base flood elevations along this section range from 1,518 to more than 1,525 ft, as shown on the FEMA maps.

At Skunk Creek, CAP Canal, Deadman Wash, and the New River, the existing I-17 mainline crosses drainages on bridge structures. The proposed I-17 improvements would include the widening of the bridges over these channels. In addition, the existing culverts that convey storm water under I-17 along Scatter Wash would be extended and an additional culvert would be constructed at that location. A detention basin would also be constructed south of Scatter Wash on the west side of I-17 to accommodate storm water runoff.

The preferred alternative would be designed to minimize floodplain encroachments and ensure that the flood-carrying capacity of the drainages crossing the project area would not be impaired. Construction of the preferred alternative would not constitute a hazardous or incompatible use of floodplains; would not result in longitudinal or substantial floodplain encroachment; would not result in greater than a 1-ft rise in base flood elevations; would have no impact on natural and beneficial floodplain values; and would be consistent with FEMA, ADOT, and FCDMC standards regarding highway construction in floodplains.

2. Section 404/401 of the Clean Water Act

A jurisdictional determination regarding waters of the U.S. was made by delineating the ordinary high water mark for Scatter Wash, Skunk Creek, Deadman Wash, the New River, and other small ephemeral washes in the project area. These delineations were conducted in accordance with the U.S. Army Corps of Engineer's (COE) Delineation Manual (COE 1987). The COE's concurrence in the jurisdictional determination would be obtained prior to publication of the final environmental document.

Sixteen jurisdictional washes traverse the project area. The preferred alternative would require drainage improvements at these wash crossings. At Skunk Creek, Deadman Wash, and the New River, the proposed roadway would span over these waterways on widened bridges. The crossing of Scatter Wash and other unnamed drainages would require the extension of existing concrete box culverts (CBC) or corrugated metal pipes (CMP). Estimated impacts to jurisdictional waters of the U.S. are listed in Table 6.

The project would result in increased storm water runoff from the additional impervious roadway surfaces. A large concrete-lined channel would be constructed south from Skunk Creek to a new detention basin south of Scatter Wash on the west side of I-17 to convey on- and off-site runoff. The channel, which would vary from 24 to 36 ft wide and 3 to 6 ft deep, would run parallel to and east of the east frontage road and the ramps at the Pinnacle Peak Road TI. This channel would cross beneath the ramps and run through the infield at the Happy Valley Road TI.

During final design, the project plans would be reviewed to verify the extent of encroachment into waters of the U.S., and permits required under Sections 401 and 404 of the Clean Water Act would be acquired by ADOT. Based on the review of current design concept plans, the proposed



improvements to I-17 would be eligible for a COE Nationwide Permit 14 issued under Section 404 of the Clean Water Act, and Section 401 certification would be in accordance with the Arizona Department of Environmental Quality's (ADEQ) Water Quality Certification requirements. All discarded waste (including, but not limited to, human waste, trash, debris, oil drums, fuel, ashes, equipment, concrete, and chemicals) generated during construction activities would be removed and/or disposed according to federal and state regulations.

Table 6 – Estimated Impacts to Waters of the U.S.

Crossing No.	Location (MP)	Type of work	Area of impact (acres)
1	216.6 (Scatter Wash)	Extend CBC	0.05
2	216.7	Extend CBC	0.06
3	219.1 (Skunk Creek)	Widen bridge	0.13
4	223.2	Extend CBC	0.23
5	223.4	Extend CMP	0.06
6	224.1	Extend CMP	0.01
7	224.1	Extend CMP	0.01
8	224.6	Extend CBC	0.03
9	225.0	Extend CBC	0.03
10	225.2	Extend CBC	0.03
11	226.9 (Deadman Wash)	Widen bridge	0.26
12	227.3	Extend CBC	0.04
13	230.9	Extend CBC	0.01
14	231.2	Extend CBC	0.05
15	231.4 (New River)	Widen bridge	0.33
16	232.5	Extend CBC	0.33

3. Arizona Pollutant Discharge Elimination System/Storm Water Pollution Prevention Plan

Because one or more acres of land would be disturbed during construction, an Arizona Pollutant Discharge Elimination System general permit would be required. The ADOT Roadside Development Section would determine who would prepare the Storm Water Pollution Prevention Plan during final design. The Phoenix Construction District and contractor would submit the Notice of Intent and the Notice of Termination to the ADEQ.

4. Conclusion

The preferred alternative would be designed to minimize impacts to floodplains and jurisdictional waters of the U.S., and construction of the improvements would incorporate best management practices, include erosion control measures, and comply with all COE and ADEQ water quality permit terms and conditions to protect water quality in the project area. Therefore, the preferred alternative would have no substantial impact on water quality.



D. Biological Resources

1. Description of Ecosystem or Biological Community

The southernmost portion of the project area, from SR 101L to Happy Valley Road, is characterized by urban development, where vegetation is generally limited to common landscaping species, grasses, and creosotebush. This area generally does not provide substantial wildlife habitat resources. From Happy Valley Road to New River Road, the biological community is more natural in composition, although recent development and construction impacts have negatively affected the ecosystem and quality of wildlife habitat. This area is dominated by creosotebush and saguaros, but also includes mesquite, acacia, and palo verde trees along wash channels.

2. Wildlife

a. Threatened/Endangered Species

The U.S. Fish and Wildlife Service's (USFWS) list of endangered, threatened, candidate, and proposed species for Maricopa County includes the wildlife species listed in Table 7. Designated critical habitat for the listed species does not occur within the project area. A Biological Review conducted for this project (Appendix B) determined that this project would have no effect on any of the listed species. The preferred alternative would have no effect on the California brown pelican, desert pupfish, Gila chub, Gila topminnow, Mexican spotted owl, razorback sucker, southwestern willow flycatcher, yellow-billed cuckoo, or Yuma clapper rail because suitable habitat for these species does not occur within the project area. The preferred alternative would have no effect on the Sonoran pronghorn because the project area is located well outside the known range for this species. The preferred alternative would have no effect on the bald eagle because no suitable nesting or roosting sites for this species are present in the project area.

Table 7 – Maricopa County Species List (Wildlife)

Common Name	Scientific Name	Listing Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Cactus ferruginous pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	Endangered
California brown pelican	<i>Pelecanus occidentalis californicus</i>	Endangered
Desert pupfish	<i>Cyprinodon macularius</i>	Endangered
Gila chub	<i>Gila intermedia</i>	Proposed Endangered
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	Endangered
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuenae</i>	Endangered
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered
Sonoran pronghorn	<i>Antilocapra americana sonoriensis</i>	Endangered
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered

The cactus ferruginous pygmy-owl (CFPO) utilizes Sonoran desertscrub and xeroriparian habitats, which are present in the northern project area. However, the preferred alternative would



have no effect on the CFPO because most of the area affected by construction is located within the existing R/W, immediately adjacent to the existing roadway, and the area adjacent to the I-17 R/W has been substantially degraded due to proximity to rapidly urbanizing areas and roadway construction. These areas do not provide CFPO habitat.

In addition, the preferred alternative would have no effect on the lesser long-nosed bat. Although the project area is within the known range of the lesser long-nosed bat, the project area does not contain suitable roosting or maternal sites for this species. Food plants for this species include saguaro and agave, both of which are present in the project area. Vegetation removal due to construction could result in the loss of food plants for this species; however, suitable foraging habitat for this species is abundant in the undeveloped areas east and west of the project area. In addition, a revegetation plan would be implemented to re-establish native vegetation in disturbed areas. This plan would include salvaging and transplanting saguaros impacted by project construction. It is anticipated that construction would require transplanting approximately 60 saguaros currently located within the median.

b. Arizona Species of Concern

The AGFD's list of special status species for the project vicinity includes the Sonoran desert tortoise (*Gopherus agassizii*), which is classified as Wildlife of Special Concern in Arizona. Potential Sonoran desert tortoise habitat exists adjacent to I-17 in several locations within the project area. Therefore, construction of the project would adhere to AGFD's Tortoise Handling Guidelines (Appendix C).

3. Plants

a. Threatened/Endangered Species

The USFWS's list of endangered, threatened, candidate, and proposed species for Maricopa County includes the species listed in Table 8. A Biological Review conducted for this project (Appendix B) determined that this project would have no effect on any of the listed species because it would be constructed outside the normal elevation range and/or habitat characteristics of these species.

Table 8 – Maricopa County Species List (Plants)

Common Name	Scientific Name	Listing Status
Arizona agave	<i>Agave arizonica</i>	Endangered
Arizona cliffrose	<i>Purshia subintegra</i>	Endangered

b. Arizona Native Plant Law Species

Protected native plants are found in the project area. These species include various cactus species, such as cholla, prickly pear, and saguaro, and leguminous trees such as palo verde, mesquite, and ironwood. Other protected native plant species occurring in the project area include agaves and yuccas.



Protected native plants would be impacted by construction of the preferred alternative. During final design, ADOT would determine the requirements for salvaging any impacted plants for replanting and prepare a plant salvage and revegetation plan. Also, the ADOT Roadside Development Section would notify the Arizona Department of Agriculture at least 60 days prior to the start of construction to afford commercial salvagers the opportunity to remove and salvage any plants not included in the project's plant salvage and revegetation plan.

4. Riparian Habitat

The only riparian habitat in the vicinity of the project is located along the New River. The preferred alternative would not affect this habitat type, as it is located more than ¼ mile northeast of the project area.

5. Vegetation

Areas of natural desert vegetation within the project area consist of typical Sonoran desertscrub species. Primary vegetation includes palo verde, mesquite, and numerous species of cactus and shrubs. The section of the project south of Happy Valley Road presents an urban, developed landscape in which very little natural vegetation is present, and most plants in the area consist of typical southwestern landscaping species. The majority of the areas affected by the proposed highway improvements would consist of the highway median and highway roadside areas, which are not heavily vegetated. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.

6. Invasive Species

Under Executive Order 13112, dated February 3, 1999, projects that occur on federal lands or are federally funded must: "subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded."

During final design, individual construction segments of the project area would be surveyed by ADOT's Natural Resources Section to determine if invasive species are present within the segment. If invasive species were found within a given construction segment, the ADOT Natural Resources Section would treat these species prior to construction and would continue any necessary treatments following construction completion. In addition, all disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.

In order to prevent the introduction of invasive species, the construction contractor would be required to wash all earth-moving and hauling equipment at the contractor's storage facility prior to entering the construction site. If invasive species were found within a given construction segment, the contractor would also be required to wash all earth-moving and hauling equipment prior to leaving the construction site in order to prevent the spread of invasive species seed to



uncontaminated areas. The contractor would notify the ADOT Natural Resources Section of the location of any proposed wash sites prior to their operation.

7. Conclusion

In conclusion, the preferred alternative would minimize impacts to wildlife habitat and vegetation by widening to the inside of the existing I-17 roadway, where habitat values are minimal. These impacts would be mitigated by salvaging and transplanting saguaros, complying with AGFD guidelines to protect Sonoran desert tortoise during construction, revegetating disturbed areas with salvaged plants and native species seed, and preventing the spread of invasive species. Therefore, the preferred alternative would have no substantial impact on biological resources.

E. Visual Resources

1. Existing Conditions

From south to north, the freeway's visual environment shifts from an urban superhighway interchange, to open Sonoran desert scrub with expansive views, to tighter views as the roadway cuts through desert hillsides and washes, to views of the new community of Anthem, and then to views of the rustic, desert community of New River. As discussed in the project's visual assessment study report (ADOT 2002d), it was found that the most visually distinctive portions of the project area occur where the roadway traverses washes or cuts through hillsides.

2. Visual Effects

The visual impact evaluation conducted for this project assessed changes in visual character resulting from the preferred alternative as compared to the No Action Alternative. The magnitude of these changes is expressed qualitatively using the terms "severe," "substantial," "notable," or "subtle."

The preferred alternative would not result in severe changes in the visual character of any of the roadway segments in the project area. Substantial changes would occur in the visual environment of I-17 between Pioneer Road and Daisy Mountain Road due to the loss of the horizontal and vertical separation of the mainlines, construction of retaining walls and centerline barrier, and widening of the existing dual bridges and installation of bank stabilization at the Deadman Wash crossing. Notable changes would occur at the New River crossing, where the dual bridges would be rebuilt and the wash slopes stabilized.

Notable changes would result from construction of a noise barrier from MP 219.6 to 220.3 between the southbound mainline and the west frontage road, because it would add more urban-appearing contrasts into an area that is still fairly natural in character. Subtle changes would occur due to construction of noise barriers from MP 215.6 to 215.9 and MP 216.3 to 216.7 on the east side of the northbound frontage road and from MP 216.1 to 216.2 on the west side of I-17. In addition, notable changes would occur due to construction of a retaining wall and median barrier at the Pioneer Road TI to accommodate the highway widening.



Subtle changes would be introduced due to construction of new drainage features. The construction of a concrete-lined channel east of I-17 from Skunk Creek to Scatter Wash would create more visual impacts than the existing drainage. However, the channel would be located east of the frontage road, would be behind a noise barrier for a portion of its length, and would be low-profile. South of Scatter Wash on the west side of I-17, a detention basin would also be constructed.

3. Mitigation Measures

The following mitigation measures would be included to minimize visual impacts resulting from construction of the preferred alternative:

- Retaining walls and noise barriers would be constructed of materials that complement the surrounding landscape's colors and textures. In addition, retaining walls associated with any rock cuts would be compatible with the rugged textures, colors, and lines of the surroundings and with those of the new median retaining walls.
- The dual New River bridges would be painted to blend with the desert wash nature of their surroundings.
- Wherever adequate space is available, landscaping would be provided along I-17.

4. Conclusion

Construction of the preferred alternative would have an impact on the visual character of the project area because it would increase the visual dominance of the roadway and detract from the rural setting of the northern project area. However, the incorporation of the mitigation measures outlined above into the design of the improvements would reduce the effect of construction on the visual environment. Therefore, the preferred alternative would have no substantial impact on visual resources.

F. Air Quality Analysis

1. Air Quality Standards and Conformity

The Clean Air Act of 1970 and associated amendments in 1977 and 1990 established National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb), as shown in Table 9. Primary and secondary standards for NAAQS were established for most of the criteria pollutants. The Clean Air Act Amendments of 1990 authorized the Environmental Protection Agency (EPA) to designate those areas that have not met the NAAQS as nonattainment areas and to classify them according to their degree of severity.

The I-17 project area lies within the Maricopa County nonattainment area for CO, PM₁₀, and O₃. For areas that have been designated as nonattainment areas, the State Implementation Plan (SIP) must outline the actions required to achieve compliance with the NAAQS. Projects in designated nonattainment areas must then demonstrate conformance with the SIP and the local Transportation Improvement Program. The project would be in an area that does not comply with all NAAQS. Therefore, federal conformity procedures would apply to this project.

**Table 9 – National Ambient Air Quality Standards**

Pollutant	Averaging Time	Primary Standard ¹	Secondary Standard ²
CO	1 hour	35 ppm	--
	8 hours	9 ppm	--
NO ₂	Annual	0.05 ppm	0.05 ppm
O ₃	1 hour	0.12 ppm	0.12 ppm
	8 hours	0.08 ppm	0.08 ppm
PM ₁₀	24 hours	150 µg/m ³	150 µg/m ³
	Annual	50 µg/m ³	50 µg/m ³
PM _{2.5}	24 hours	65 µg/m ³	65 µg/m ³
	Annual	15 µg/m ³	15 µg/m ³
SO ₂	3 hours	--	0.5 ppm
	24 hours	0.14 ppm	--
	Annual	0.03 ppm	--
Pb	Quarter	1.5 µg/m ³	1.5 µg/m ³

¹ Defines levels “necessary to protect the public health” (40 CFR 50)

² Defines levels “necessary to protect the public welfare” (40 CFR 50)

As part of its 2002 conformity analysis (MAG 2002b), MAG demonstrated that all projects within its jurisdiction, including the proposed widening of I-17, would not worsen existing conditions relative to PM₁₀. The report indicated that MAG’s current serious area plan for PM₁₀ (MAG 2000), which was submitted to EPA in February 2000, used the required EPA emissions models and established a future PM₁₀ emissions budget of 59.7 metric tons per day for the annual average as well as 24-hour PM₁₀ standards. The EPA issued a notice, effective April 21, 2000, stating that MAG’s proposed PM₁₀ budget was adequate for transportation conformity purposes.

2. Methodology for Air Quality Modeling

An air quality assessment was performed to predict the impact of vehicle emissions from the proposed roadway on future CO levels in the project vicinity. The air quality analysis, which is presented in detail in a separate air quality assessment report (ADOT 2002a), focused on the local impact of CO emissions estimated for the existing roadway configurations in 2002 and 2025 (No Action Alternative) and for the preferred alternative in 2025. The analysis was performed using the CAL3QHC line source dispersion model, which was developed for the EPA in order to calculate the total emissions from moving and idling vehicles as well as to predict the dispersion and estimated concentrations of inert pollutants, primarily CO, near highways and arterial street intersections. Emissions factors were derived using EPA’s model MOBILE5a.

Predicted 1-hour concentrations of CO resulting from the proposed roadway were generated and then added to the background concentration to derive the total predicted CO levels. The background 1-hour CO concentration used for this analysis was 2 parts per million (ppm), based on data from monitoring sites in north Phoenix, estimated 1-hour concentrations obtained from modeling the existing roadway, and MAG urban airshed model simulations. Predicted 8-hour concentrations were then calculated from the 1-hour concentrations using a persistence factor to account for variations in traffic characteristics and meteorological conditions.



3. Results of Air Quality Modeling

Under the No Action Alternative, the maximum predicted 1-hour concentrations of CO in 2025 generally were higher than those values obtained for the year 2002. This increase is due to the large increase in traffic volumes in 2025. The predicted 1-hour and 8-hour concentrations neither exceed nor approach the federal NAAQS. The predicted 1-hour and 8-hour CO concentrations under the preferred alternative generally would remain near those levels predicted for the No Action Alternative. With the preferred alternative, predicted CO concentrations would be substantially below NAAQS, as shown in Table 10. The individual air quality receptor locations and the results of the CO analysis for each location are shown in Appendix D.

Table 10 – Predicted Carbon Monoxide Concentrations

CO Level	Existing Conditions (2002)	No Action Alternative (2025)	Preferred Alternative (2025)
1-hour concentration	2.3 to 4.0 ppm	2.5 to 6.5 ppm	2.7 to 7.5 ppm
8-hour concentration	1.6 to 2.8 ppm	1.8 to 4.6 ppm	1.9 to 5.3 ppm

4. Construction Impacts and Mitigation

Some temporary deterioration of air quality would be expected due to the operation of construction equipment and the slower traffic speeds associated with a construction zone. However, this localized condition would be discontinued when the project was completed. Short-term impacts due to particulate matter or dust emissions may also occur during the construction phase, but these would be reduced through the use of watering or other dust control measures. Fugitive dust generated from construction activities would be controlled in accordance with ADOT's Standard Specifications (ADOT 2000c), special provisions, and local rules or ordinances. Construction of the preferred alternative would comply with *Maricopa County Air Quality Rule 310 – Open Fugitive Dust Sources* (Appendix E) and any required air quality permits.

5. Conclusion

The air quality analysis demonstrated that CO concentrations after construction of the preferred alternative would remain well below NAAQS limits throughout the project area, and temporary impacts would be minimized by the use of dust abatement measures. Therefore, the preferred alternative would have no substantial impact on air quality.

G. Noise Analysis

1. Noise Policy

Under federal noise abatement guidelines, noise impacts are analyzed based upon the land use activity and a noise threshold for each of the land use categories (Table 11). Under the ADOT *Noise Abatement Policy* (NAP) (March 2000), mitigation is considered for Category B properties when noise levels exceed 64 decibels (dBA). Additionally, mitigation would be considered for Category B properties if the predicted traffic noise levels substantially exceed the existing noise level, defined as an increase of 15 dBA or greater.

**Table 11 – Noise Abatement Criteria**

Activity Category	Description	Threshold
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities are essential if the area is to continue to serve its intended purpose.	57 dBA (Exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 dBA (Exterior)
C	Developed lands, properties, or activities not included in Categories A or B.	72 dBA (Exterior)
D	Undeveloped lands.	72 dBA (Exterior)
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 dBA (Interior)

2. Noise Monitoring

To determine existing noise conditions, ambient noise level readings were taken at five locations in the project area in October 2001 and January 2002, as indicated in the noise study technical report (ADOT 2002c). Noise levels were monitored using an integrating sound level meter placed approximately 5 ft above the ground. Existing ambient noise levels varied from 53 to 63 dBA (Table 12).

Table 12 – Ambient Noise Levels

Monitoring Site	MP	Side of I-17	Description	Ambient Noise Level
M1	215.7	East	Cactus Trail Apartment Complex	63 dBA
M2	216.5	East	Desert's Edge RV Park	58 dBA
M3	220.0	West	KB Homes	59 dBA
M4	224.4	East	Tramonto Development	55 dBA
M5	228.1	East	Proposed Anthem High School	53 dBA

3. Noise Assessment

Noise impacts adjacent to the project area were evaluated by comparing predicted traffic noise levels in the existing (2001) condition to noise levels for the design year (2025) for both the No Action and preferred alternatives. Noise levels were assessed at representative sensitive noise receivers that were identified within the project limits. The receiver sites were identified based on land use type and proximity to the proposed highway alignment. Noise receiver locations are shown in Appendix F.

Predicted traffic noise levels were developed using the noise prediction model STAMINA/Optima 2.0. The future traffic noise condition evaluated for the project area was LOS C. This LOS represents the worst hourly traffic noise impacts, since traffic speeds are at or



near the posted speed limit and lane capacity is high. The results of this analysis for each receiver location are presented in Appendix F.

a. Existing Conditions (2001)

Predicted 2001 traffic noise levels ranged from 48 dBA north of Pioneer Road to 68 dBA at the mobile home parks north of Deer Valley Road adjacent to I-17. Under existing conditions, six of the receivers currently meet or exceed ADOT's Noise Abatement Criteria (NAC) threshold of 64 dBA.

b. No Action Alternative (2025)

For the No Action Alternative, predicted noise levels in 2025 along the existing roadway ranged from 51 dBA near Pioneer Road to 69 dBA at the mobile home parks north of Deer Valley Road. The noise level increase from existing conditions would range from 0 to 3 dBA at all receivers. Under the No Action Alternative, seven of the receivers would meet or exceed ADOT's NAC.

c. Build Condition (2025)

For the build condition, predicted unmitigated noise levels along the widened roadway in 2025 would range from 51 dBA near Pioneer Road to 80 dBA at the mobile home parks north of Deer Valley Road. South of Carefree Highway, the predicted noise levels under the build alternative would be 12 to 13 dBA higher than existing conditions, and 10 to 12 dBA higher than the No Action Alternative. From Carefree Highway to New River Road, the predicted noise levels under the build alternative would be 3 to 7 dBA higher than existing conditions, and 0 to 5 dBA higher than the No Action Alternative.

The increases in noise levels are directly related to increases in traffic volumes due to the addition of general purpose, HOV, and auxiliary lanes. Under the build condition, 16 of the receiver sites would experience noise levels that would either approach or exceed ADOT's NAC.

4. Noise Abatement

For those locations at which noise levels are predicted to exceed ADOT's NAC, noise abatement measures were considered. Generally, noise mitigation consists of noise barriers within the proposed R/W line. Noise barriers typically consist of earthen berms, concrete/masonry walls, or combinations of these.

According to ADOT's NAP, a residence is defined as being benefited if the noise reduction at a given receptor would be at least 5 dBA as a result of construction of a noise barrier. However, noise mitigation may not be implemented if the cost of abatement per benefited residence is greater than \$35,000. Benefited receivers include single-family dwelling residences, including mobile homes, and individual residential units within multi-family buildings.

To analyze possible mitigation for noise impacts, the effect of mitigation on noise levels at residences adjacent to the proposed roadway was examined where the predicted unmitigated noise levels approach or exceed ADOT's NAC. The results of the mitigation analysis for the preferred alternative are shown in Appendix F.



According to the analysis, noise mitigation would be warranted at five locations. The use of noise barriers would be further evaluated during final design, in consultation with affected property owners, to resolve potential conflicts with utilities, drainage, planned roadway alignments, property access, and aesthetics. Furthermore, the use of a rubberized pavement overlay as noise mitigation would be investigated during final design. FHWA and ADOT are currently conducting a pilot study to test the long-term effectiveness of rubberized asphalt pavement overlays for traffic noise reduction in urban areas.

5. Construction Noise

Temporary noise impacts would be experienced during construction of the proposed improvements. An analysis was conducted to assess the collective impact of construction noise. The maximum noise levels (L_{\max}) of various types of construction equipment were measured at the R/W line during a previous highway construction project (Table 13). The results of the preliminary estimates indicate that sensitive receivers could be substantially affected by construction noise if the receivers are immediately adjacent to the R/W. The highest noise levels would occur during the grading/earthwork phase. Typically, construction noise levels continually change as the construction phases are completed. Since these noise levels are temporary and not continuous, mitigation measures are not specifically warranted for construction-related noise.

Table 13 – Temporary Noise Impacts

Construction Phase	Equipment	Equipment L_{\max} ¹	Distance to R/W	L_{\max} at R/W ²
Site Clearing	Dozer	84 dBA	50 ft	----
	Backhoe	85 dBA	50 ft	88 dBA
Grading/Earthwork	Scraper	92 dBA	75 ft	----
	Grader	91 dBA	75 ft	93 dBA
Foundation	Backhoe	85 dBA	100 ft	----
	Loader	84 dBA	100 ft	85 dBA
Base Preparation	Compressor	85 dBA	100 ft	----
	Dozer	84 dBA	100 ft	85 dBA

¹ Noise levels provided by equipment manufacturer.

² Measured noise levels during use of equipment in highway construction.

6. Conclusion

As discussed in the noise impact analysis, the preferred alternative would include the construction of noise barriers at five locations in the project area to reduce noise impacts on properties adjacent to the roadway. Therefore, the preferred alternative would have no substantial impact on noise levels in the project area.

H. Hazardous Materials

A Preliminary Initial Site Assessment for hazardous materials was conducted for the project area in order to determine the potential for encountering environmental contamination from hazardous materials due to previous and/or existing activities in the proposed R/W for the preferred alternative. Field reconnaissance was conducted in order to identify potential



contamination based on observations of existing and former land uses, soil conditions, construction materials, chemicals, and on-site equipment.

A search of available ADEQ and EPA records disclosed the following types of hazardous materials concerns within approximately ¼ mile of the project area: Underground Storage Tanks (UST); Leaking Underground Storage Tanks (LUST); hazardous materials incidents; Resource Conservation and Recovery Act (RCRA) facilities; one active landfill; drywells; Comprehensive Environmental Response, Compensation, and Liability Act sites; air pollutant emissions; toxic chemical releases; and water discharge permitted facilities.

Further investigation of the hazardous materials records resulted in the identification of 12 potential hazardous materials sites on properties adjacent to or within the existing R/W in the project area (Table 14). Initial Site Assessments (ISA) would be obtained during final design if R/W is required from, or excavation is anticipated on or adjacent to, the properties identified with potential hazardous material contamination. If necessary, remedial measures would be implemented based upon the ISA results. If suspected hazardous materials are encountered during construction, work would cease at that location and the project engineer would be notified immediately to arrange for proper assessment, treatment, or disposal of those materials.

Table 14 – Potential Hazardous Materials Concerns

Site Name/Location	Type	Impacts
Odessa Cardlock #17, 22047 North Black Canyon Highway	UST, LUST (closed case)	R/W would be required from this property. The LUST site has been remediated to ADEQ recommended levels. Therefore, there would be no risk at this site.
Biscuit Flat General Store (demolished), 3507 West Carefree Highway	UST, LUST (open case)	Impacts to this site, which is located adjacent to the southbound I-17 on-ramp at the Carefree Highway TI, are not anticipated as a result of construction of the preferred alternative. However, this site would be investigated during design of the Carefree Highway TI reconstruction and design of the City of Phoenix frontage road planned in this location.
John C. Lincoln Hospital, 19829 North 27 th Avenue	UST, RCRA generator, drywell	No R/W would be required from this site. No further investigation would be required.
Medical Office Building, 19841 North 27 th Avenue	Drywell	No R/W would be required from this site. No further investigation would be required.
Rose Garden Office Building, 2411 West Rose Garden Lane	Drywell	No R/W would be required from this site. No further investigation would be required.
I-17 north of Happy Valley Road	Diesel fuel spill	This site is located within the existing I-17 R/W. An ISA would be conducted to evaluate the need for hazardous materials testing and/or remediation at this site.

(Table 14 continues on next page)

**Table 14 – Potential Hazardous Materials Concerns (continued)**

Site Name/Location	Type	Impacts
I-17 at New River exit in wash	Spill of unknown material	This site is located within the existing I-17 R/W. An ISA would be conducted to evaluate the need for hazardous materials testing and/or remediation at this site.
I-17 and Pioneer Road	Gasoline spill	This site is located within the existing I-17 R/W. An ISA would be conducted to evaluate the need for hazardous materials testing and/or remediation at this site.
I-17 and Beardsley Road	Diesel fuel spill	This site is located within the existing I-17 R/W. An ISA would be conducted to evaluate the need for hazardous materials testing and/or remediation at this site.
I-17 and Carefree Highway	Methylisothiocyanate release	This site is located within the existing I-17 R/W. However, the incident involved the release of fumes only. No further investigation would be required.
Northeast corner of I-17 and Happy Valley Road	Diesel fuel spill	This site is located within the existing I-17 R/W. An ISA would be conducted to evaluate the need for hazardous materials testing and/or remediation at this site.
I-17 at southbound MP 228	Diesel fuel spill	This site is located within the existing I-17 R/W. An ISA would be conducted to evaluate the need for hazardous materials testing and/or remediation at this site.

I. Cultural Resources

Cultural resources located within the study area were identified from information on file at the State Historic Preservation Office (SHPO), Arizona State Museum, BLM Arizona Office and Phoenix Field Office, BOR, and ASLD. Additional information was obtained from historic General Land Office maps. The cultural resources inventory identified all surveys, data recovery, and area-specific literature reviews within the review area, as documented in *Literature Review of Interstate 17 Between Pima Freeway and Black Canyon City, Maricopa and Yavapai Counties, Arizona* (ADOT 2000a).

A detailed reconnaissance survey for cultural resources was conducted within the proposed R/W for the ultimate widening of I-17, as documented in *Cultural Resources Survey of Interstate 17 Between Mileposts 214 and 233, Pima Freeway to the New River Traffic Interchange, Maricopa County, Arizona* (ADOT 2002b). The survey resulted in the identification of 32 sites in the project area. Three of these sites – historic Old Black Canyon Highway, New River-Stricklin, and Sun-Up Ranch – were previously recorded. An in-depth survey of a portion of the Sun-Up Ranch site was also conducted, as documented in *Addendum to a Cultural Resources Survey of Interstate 17 Between Mileposts 214 and 233, Pima Freeway to the New River Traffic Interchange, Maricopa County, Arizona* (ADOT 2003a). A summary of cultural resources sites in the project area is included in Table 15. Four sites are eligible for listing in the National Register of Historic Places (NRHP), one is currently listed, and 20 are not eligible. The



eligibility status of seven sites is unknown and further investigation would be required before their NRHP eligibility could be determined.

Table 15 – Cultural Resources Summary

Site No.	Description	NRHP Eligibility	Impact
AZ T:4:131 (ASM)	Old Black Canyon Highway (17 segments)	Eligible	None
AZ T:4:192 (ASM)	New River-Stricklin site; prehistoric habitation and artifact scatter	Eligible	None
AZ T:4:329 (ASM)	Chipped lithic scatter with features	Not eligible	None
AZ T:4:330 (ASM)	Prehistoric habitation and artifact scatter	Unknown	None
AZ T:4:331 (ASM)	Prehistoric artifact scatter	Unknown	None
AZ T:4:332 (ASM)	Historic road segment	Not eligible	None
AZ T:4:333 (ASM)	Historic road segment	Not eligible	None
AZ T:4:334 (ASM)	Historic road segment	Not eligible	None
AZ T:4:335 (ASM)	Historic road segment	Not eligible	None
AZ T:4:336 (ASM)	Historic road segment	Not eligible	None
AZ T:4:337 (ASM)	Prehistoric habitation and artifact scatter	Eligible	None
AZ T:4:338 (ASM)	Prehistoric artifact scatter	Unknown	None
AZ T:4:339 (ASM)	Historic road segment	Not eligible	None
AZ T:4:340 (ASM)	Historic road segment	Not eligible	None
AZ T:4:341 (ASM)	Historic road segment	Not eligible	None
AZ T:4:342 (ASM)	Historic trash scatter	Not eligible	None
AZ T:4:343 (ASM)	Chipped lithic scatter	Not eligible	None
AZ T:4:344 (ASM)	Chipped lithic scatter with rock features	Not eligible	None
AZ T:4:345 (ASM)	Chipped lithic scatter	Not eligible	None
AZ T:4:346 (ASM)	Prehistoric quarry and artifact scatter with possible petroglyph	Eligible	None
AZ T:4:347 (ASM)	Historic road segment	Not eligible	None
AZ T:4:349 (ASM)	Prehistoric artifact scatter with possible feature	Unknown	None
AZ T:4:350 (ASM)	Historic road segment	Not eligible	None
AZ T:4:352 (ASM)	Chipped lithic scatter	Not eligible	None
AZ T:8:152 (ASM)	Historic trash scatter	Not eligible	None
AZ T:8:153 (ASM)	Prehistoric and historic artifact scatter	Unknown	None
AZ T:8:154 (ASM)	Rock features	Not eligible	None
AZ T:8:155 (ASM)	Historic earthen dam and foundation remnant	Not eligible	None
AZ T:8:156 (ASM)	Historic/modern foundation remnant	Not eligible	None
AZ T:8:157 (ASM)	Prehistoric artifact scatter	Unknown	Yes
AZ T:8:158 (ASM)	Prehistoric artifact scatter	Unknown	None
Sun-Up Ranch	Historic homestead	Listed	Yes

Based on the results of the cultural resource survey and a review of the conceptual engineering drawings for the preferred alternative, one site of unknown eligibility (AZ T:8:157 [ASM]) would be affected by the project. Every effort to minimize impacts to this site would be made during final design. If the site could not be avoided, a testing and/or data recovery program would be implemented at this location during final design to determine site eligibility and the need for mitigation.



In addition, the preferred alternative would require 0.7 acres of new R/W from the Sun-Up Ranch, which abuts the western frontage road south of the New River crossing. This property is listed on the NRHP under criterion 'a' as a Depression-era homestead, and is therefore protected by the provisions of Section 4(f) of the U.S. Department of Transportation Act of 1966 (page 48). The new R/W would be required adjacent to the existing frontage road on the eastern periphery of this property. Construction of the preferred alternative would have no adverse effect upon the Sun-Up Ranch because it would not result in impacts to any of the site's contributing elements. The SHPO concurred with the "no adverse effect" determination on July 24, 2003.

A Programmatic Agreement (PA) among the SHPO, FHWA, and ADOT has been executed in order to identify specific measures to mitigate impacts to cultural resources resulting from construction of the preferred alternative (Appendix G). Correspondence regarding cultural resources coordination is included in Appendix H.

If previously unidentified cultural resources were encountered during activities related to the construction of the project, the contractor would stop work immediately at that location and take all reasonable steps to secure the preservation of those resources. The project engineer would contact the ADOT Historic Preservation Team immediately and make arrangements for the proper treatment of those resources.

J. Socioeconomic Impacts

1. Demographics/Minority Groups

Demographic data obtained from the U.S. Bureau of the Census were used to compare the demographic profile of the project area with Maricopa County and Arizona. In Table 16, the population of the project area is represented by the total population of the 13 census block groups located adjacent to I-17 within the project area. The characteristics of each block group and maps of their locations are included in Appendix I. Census tracts are small statistical subdivisions of a county, block groups are smaller statistical subunits of census tracts, and census blocks are the smallest subunit of census data available.

Although there are some variations, the overall population in the project area does not differ substantially from the Maricopa County or Arizona averages. The project area has a slightly higher percentage of males, whites, and disabled persons than the state and the county, but has lower percentages of females, African-Americans, American Indians, Asians, other racial groups, persons of two or more races, Hispanic or Latino persons, persons age 60 years and over, and persons defined as below the poverty level. The percentage of Native Hawaiian/Pacific Islanders in the project area is equal to the state and county average.

As shown in Appendix I, five block groups contain substantially higher than average percentages of minority or low-income groups, as described below.

- Census Tract 303.29, Block Group 3 has a high percentage of African-Americans. A detailed analysis of the census units adjacent to the west side of I-17 between Carefree Highway and New River Road shows that 96 percent of the population is located within the census block

corresponding to the incarcerated population at the Black Canyon Federal Correctional Center (Figure 5).

- Census Tract 303.37, Block Group 3 has a high percentage of persons age 60 years and older. Two census blocks within this group are located adjacent to the west side of I-17 between SR 101L and Yorkshire Drive. These areas have no permanent population and are occupied by the John C. Lincoln Hospital (Figure 4).
- Census Tract 303.42, Block Group 3 has a high percentage of Hispanic or Latino persons and African-Americans. The only inhabited census block in this group adjacent to the west side of I-17 between Happy Valley Road and Pinnacle Peak Road corresponds to the incarcerated population at the Adobe Mountain Juvenile Facility (Figure 4).
- Census Tract 303.80, Block Group 1 has a high percentage of persons age 60 years and older and disabled persons. The census blocks in this group contain the Phoenix Metro Recreational Vehicle (RV) Park and Desert's Edge RV Park, which are located adjacent to the existing I-17 frontage road south of Pinnacle Peak Road TI (Figure 4). More than 60 percent of the population of these RV parks is age 60 and over. R/W acquisition and relocations would be required at these parks, as described on page 47. A noise barrier would be provided to mitigate noise impacts in this area, as described on page 38.
- Census Tract 303.80, Block Group 2 has a high percentage of persons below the poverty level and Hispanic or Latino persons. Two inhabited census blocks within this group are located on the east side of I-17 between Deer Valley Road and Rose Garden Lane. No new R/W would be required in this area for construction of the preferred alternative. Noise impacts in this area would be mitigated through construction of a noise barrier, as described on page 38.

Table 16 – 2000 Census Data Summary

Demographic Characteristic	Project Vicinity	Maricopa County	Arizona
Total population	27,294	3,072,149	5,130,632
Gender:			
Male	53.0%	50.0%	49.9%
Female	47.0%	50.0%	50.1%
Race:			
White alone	88.2%	77.4%	75.5%
Black or African-American alone	3.0%	3.7%	3.1%
American Indian/Alaska Native alone	1.3%	1.8%	5.0%
Asian alone	1.5%	2.2%	1.8%
Native Hawaiian/other Pacific Islander alone	0.1%	0.1%	0.1%
Some other race alone	3.9%	11.9%	11.6%
Two or more races	2.0%	2.9%	2.9%
Hispanic or Latino (can be of any race)	11.8%	24.8%	25.3%
Age 60 years and older	11.4%	15.2%	17.0%
Disabled	15.5%	15.2%	14.9%
Below poverty level	7.8%	11.8%	13.9%



2. Title VI/Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, or disability. Executive Order 12898 on Environmental Justice directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. To assess potential impacts to the minority population concentrations in the project area, a Title VI/Environmental Justice evaluation was conducted.

a. Demographic Concentrations

Detailed analysis of the census data (page 43) resulted in the identification of two minority concentrations in the project area – senior citizens and disabled persons at RV parks east of the frontage road south of Pinnacle Peak Road and persons below the poverty level and Hispanic/Latino persons east of I-17 between Deer Valley Road and Rose Garden Lane. The other areas in the project area with a high proportion of minority groups were found to correspond to incarcerated populations or temporary populations associated with a hospital.

b. Impact Analysis

Minority and low-income residents in the vicinity regularly travel through the project area to access jobs, medical and social services, and shopping. While there would be temporary traffic delays due to lane restrictions during construction, access to these areas and services would be maintained (page 47). Construction of the preferred alternative would result in improved operational efficiency, reduced congestion, and improved access for minority and low-income persons in the project area using the improved roadway. Therefore, the preferred alternative would have a beneficial permanent impact and a temporary negative impact on all residents and motorists, including the identified minority concentrations adjacent to the project area.

c. Disproportionately High and Adverse Impacts

The impacts expected to result from construction of the preferred alternative were evaluated for potential disproportionately high and adverse effects on the minority populations in the project area. Impacts at the RV parks east of the frontage road south of Pinnacle Peak Road would consist of R/W acquisition, displacements, and noise level increases. In the area east of I-17 between Deer Valley Road and Rose Garden Lane, no R/W acquisition or displacements would occur, and anticipated impacts would consist of noise level increases. As described on page 47, fair compensation would be provided for R/W acquisition and a relocation assistance program would be implemented for displaced residents and businesses. In addition, noise barriers would be constructed in these areas, as described on page 38. These impacts would not constitute a high and adverse impact on the minority concentrations in the project vicinity. In addition, the temporary impacts during construction would be borne equally by all residents and the motoring public in the project area.



d. Conclusion

The project has been evaluated with regard to Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, and Executive Order 12898 on Environmental Justice. Although minorities are present within the project area, the preferred alternative would not have a disproportionately high and adverse human health and environmental impact on minority or low-income populations.

3. Neighborhood Continuity

The proposed road widening would require the acquisition of R/W on both sides of I-17 between Deer Valley Road and Pinnacle Peak Road. This R/W acquisition would result in impacts to one mobile home park and three RV parks. However, because the R/W acquisition would occur immediately adjacent to the existing R/W at the edges of the parks, it would not result in the isolation of mobile home or RV lots from the surrounding park, nor eliminate access from these areas to shopping, schools, or other community services. New R/W would not be required from residential properties in any other location along the project corridor.

Conversion of the existing two-way frontage roads to one-way operations would affect traffic patterns at residential areas abutting the I-17 frontage roads, such as the Kaufman Broad (KB) Homes development located on the west side of I-17 north of Happy Valley Road. This change in traffic patterns would have no effect on neighborhood continuity because the conversion of frontage roads to one-way operations would occur as the local street network is constructed to ensure that adequate access is provided to all properties with existing access along the frontage road. In the KB Homes development, the existing local street network provides alternate routes of travel to adjacent areas.

Furthermore, access to commercial areas from residential areas along the project corridor would not be impeded because the local street network and frontage roads would be available to provide access to commercial areas during and after construction. However, construction on I-17 and its frontage roads could cause temporary traffic delays along local streets, making the trip to commercial areas longer for some residents. Because construction of the preferred alternative would not result in the separation of residential areas or impede access to commercial areas, the impact on neighborhood continuity would be minimal.

4. Emergency Services – Police, Fire, Ambulance, Hospital

The proposed road widening would have a positive impact on emergency services in the project area because the project would decrease traffic congestion on I-17, thereby improving response times. The project would have no effect on existing access to police stations, fire stations, or hospitals.

5. Social Services, Schools, Recreation

The preferred alternative would have no impact on social services or schools in the project area because the project would not affect the existing access to schools or social services located in the project vicinity.



The preferred alternative would also have no impact on recreation. The existing access to recreation resources in the project vicinity, such as the Ben Avery Shooting Range and Recreation Area (Figure 5), would not be affected by construction of the preferred alternative. In addition, the preferred alternative would have no impact on bicyclists desiring to ride north out of Phoenix. Currently, bicyclists are permitted to use the highway shoulder in areas where a parallel, directly accessible frontage road is not available. With the preferred alternative, bicyclists would continue to be permitted to utilize the outside shoulder in areas without frontage roads. The preferred alternative would include 10-ft outside shoulders, thereby providing adequate pavement width for bicyclists.

6. Relocations/Displacements

The preferred alternative would result in the displacement of one business and several mobile homes, RV hook-ups, and facilities in four trailer parks located adjacent to the existing I-17 frontage roads between Deer Valley Road and Pinnacle Peak Road (Table 17).

Table 17 – Commercial and Residential Displacements

Property Name	Residential Displacements	Commercial and Other Facility Displacements
Freeway Mini-Storage 21427 N. Black Canyon Hwy.	None	1 building
Phoenix Metro RV Park 22701 N. Black Canyon Hwy.	7 trailers 10 RV hook-up sites (Out of 310)	Clubhouse/office building, pool/spa area, and access from frontage road affected
Desert's Edge RV Park 22623 N. Black Canyon Hwy.	4 trailers 10 RV hook-up sites (Out of 212)	Perimeter of adjoining RV storage area affected
Phoenix Mobile Home Park 22036 N. Black Canyon Hwy.	1 mobile home and hook-up site (Out of 90)	1 storage building
North Phoenix RV Park 2550 West Louise Drive	2 cabins 7 RV hook-up sites (Out of 206)	None

ADOT would implement a R/W relocation program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) and FHWA's regulations concerning R/W acquisition (49 CFR Part 24). The Uniform Act provides minimum real property acquisition policies and requires uniform and equitable treatment of persons displaced as a result of a federally assisted program or project. The stated purpose of the Uniform Act is to ensure that affected persons would not suffer disproportionate injuries as a result of programs and projects designed for the benefit of the public as a whole and to minimize the hardship of displacement on such persons. The Uniform Act requires that displaced persons receive uniform and consistent services and payments regardless of race, color, sex, or national origin. Any replacement units would meet federal and state standards for "Decent, Safe, and Sanitary" housing.

7. Temporary Impacts

During construction of the facility, traffic through the area and access to adjacent properties would be maintained in accordance with current ADOT traffic control management procedures



for highway construction and maintenance. Business disruption during construction would be kept to a minimum because access to businesses and parking areas adjacent to I-17 would be maintained during construction. Temporary traffic delays would occur due to lane restrictions, which could result in short-term business disruption. In order to minimize temporary impacts, the ADOT Phoenix Construction District would provide a construction notice to adjacent residents and businesses at least two weeks prior to construction.

Lane closures along the existing I-17 roadway would be required during construction of the preferred alternative. Traffic control during construction would be in accordance with Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (FHWA 2000), Traffic Control Supplement (1996), and/or associated provision in the project plans, as determined by the ADOT Traffic Design Section.

8. Permanent Impacts

Access to properties and businesses adjacent to I-17 in the project area would be maintained, improved, or modified as a result of the proposed widening. In particular, the conversion of frontage roads to one-way from the existing two-way configuration would result in modified access for some properties. The conversion of frontage roads to one-way operations would occur as the local street network is constructed to ensure that adequate access is provided to all properties with existing access along the frontage road.

Traffic patterns on I-17 would change as a result of the addition of HOV, auxiliary, and general traffic lanes. Traffic operations along the project corridor would be improved and congestion would be decreased.

9. Conclusion

Socioeconomic impacts would result from construction of the preferred alternative due to the acquisition of new R/W from private landowners and residential and commercial displacements. The preferred alternative would minimize the need for new R/W and displacements by widening to the inside of the existing I-17 lanes. Access to adjacent properties, recreation, and services would be maintained during and after construction of the preferred alternative. The project would have no impact on neighborhood continuity and would not result in high and adverse impacts on any minority group. Therefore, the preferred alternative would have no substantial socioeconomic impacts.

K. Section 4(f) of the Transportation Act

Section 4(f) of the U.S. Department of Transportation Act of 1966 states that the FHWA “may approve a transportation program or project requiring publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if there is no prudent and feasible alternative to using that land and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use” (49 U.S. Code 303).



A “use” of a Section 4(f) resource, as defined in 23 CFR 776.135(p), occurs: 1) when land is permanently incorporated into a transportation facility; 2) when there is a temporary occupancy of land that is adverse in terms of the statute’s preservationist purposes; or 3) when there is a constructive use of land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from a resource but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

- a) the projected noise level increase, attributable to the project, substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f);
- b) the proximity of the proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of such an effect would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building or substantially detracts from the setting of a park or historic site that derives its value in substantial part due to its setting; and/or
- c) the project results in a restriction of access that substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

1. Ben Avery Shooting Range and Recreation Area

The Ben Avery Shooting Range and Recreation Area is a Section 4(f) property located adjacent to I-17 northwest of the Carefree Highway TI (Figure 5). No direct or proximity impacts would occur to this resource as a result of the preferred alternative because no new R/W would be required from this facility. No constructive use of this Section 4(f) resource would occur as a result of construction of this project because it is not a noise-sensitive facility, the preferred alternative would not interfere with the aesthetic characteristics of the area, and the project would not restrict access to the shooting range and recreation area. Therefore, the preferred alternative would have no impact on this Section 4(f) property.

2. Sun-Up Ranch

The Sun-Up Ranch abuts the western I-17 frontage road from MP 230.6 to 231.1, south of New River Road (Figure 10). The ranch, which was the site of a major sheep watering operation in the 1930s, was listed on the NRHP in 1988 as a Depression-era homestead. According to the NRHP nomination form, the property consists of seven contributing elements (four homestead cabins, two waterworks, and an orchard/sheep watering area/earthen stock pond), as well as five noncontributing elements (two mobile homes, one stable, remnants of the Black Canyon stage route, and prehistoric trash mounds). In addition, an historic rock fence was identified near the existing frontage road R/W in a 2003 cultural resources survey (ADOT 2003a). The rock fence was determined to have been associated with the original ranch and was recommended as a contributing element. The survey also determined that the vegetation within the proposed new R/W was modern in origin (planted when I-17 was constructed) and recommended that it not be considered as a contributing element to the property’s overall NRHP eligibility.

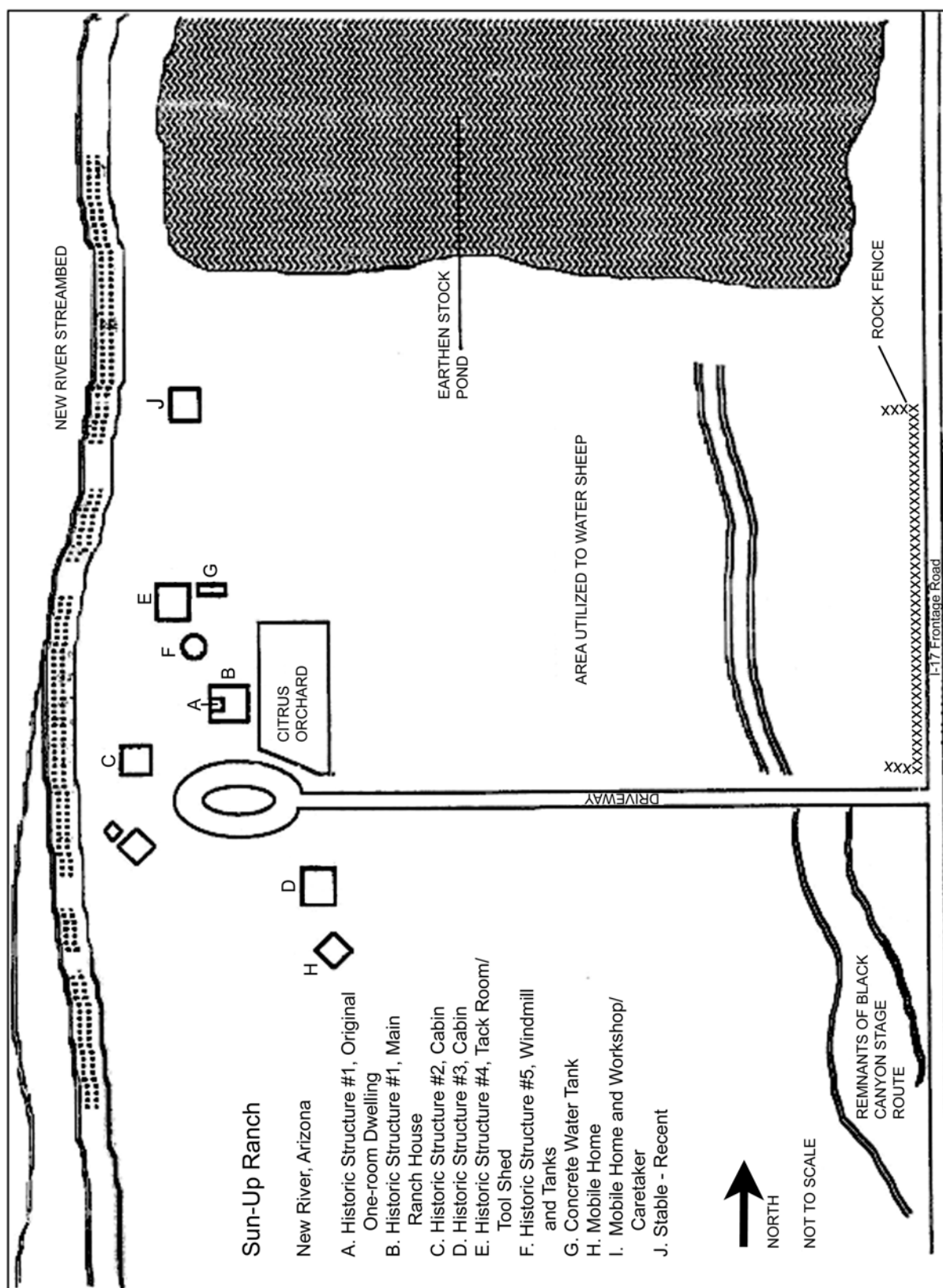


Figure 10 – Sun-Up Ranch



The preferred alternative would require the acquisition of 0.7 acres of new R/W from the Sun-Up Ranch property adjacent to the frontage road in order to accommodate a drainage channel. In order to avoid impacts to the historic rock fence, no drainage channel would be constructed along the approximately 600-ft section of the property where the rock fence is located. Therefore, no contributing elements of the site would be affected by construction of the preferred alternative. The SHPO concurred with a “no adverse effect” determination for the Sun-Up Ranch on July 24, 2003 (Appendix H). The cultural resources PA (Appendix G) would address the need for testing and/or data recovery for the stage route and trash mounds.

Improving the highway without acquiring R/W from the Sun-Up Ranch would require locating the drainage swale between the mainline and the frontage road. It would not be feasible to locate the drainage swale between the mainline and the frontage road due to inadequate R/W width in the area. The existing R/W cannot accommodate the additional mainline lanes, frontage road, and drainage swale. As a result, relocation of the drainage swale from the Sun-Up Ranch property would not be a feasible or prudent avoidance alternative.

The entire I-17 mainline could be shifted east to accommodate the additional travel lanes, drainage improvements, and frontage roads without acquiring R/W on the west side in the vicinity of the historic ranch. To provide a smooth transition to the new roadway location from the remainder of the roadway, the realignment would continue for at least 0.5 mile north and south of the site, resulting in realignment of approximately 1.5 miles of I-17 (MP 230.1 to 231.6). To realign this portion of I-17, the existing frontage roads would need to be shifted to the east along the entire length of the west side of I-17, and from MP 230.1 to about MP 231.0 on the east side. Construction of a realigned roadway would require displacing a restaurant, the New River Station Cafe and Saloon, located in an historic building south of the New River bridge on the east side of I-17. This building has not been evaluated for NRHP eligibility. With the preferred alternative, this restaurant would not be displaced and no constructive use of the historic property would occur. Noise impacts on residences east of I-17 in this section would be greater than with the preferred alternative. This alternative would have much greater temporary impacts than the preferred alternative due to the longer duration of construction. In addition, this alternative would result in substantially higher project costs than the preferred alternative due to greater R/W acquisition and the need to reconstruct 1.5 miles of roadway on a new alignment. Because the preferred alternative would not affect the existing frontage roads, have lesser temporary impacts, not require displacing a business, result in lower noise levels at residences to the east, and reduce project costs, realigning I-17 to avoid taking R/W from the Sun-Up Ranch is not a feasible or prudent avoidance alternative.

As a result, there is no feasible and prudent alternative to the use of land from the historic Sun-Up Ranch, and the project includes all possible planning to minimize harm to the property resulting from such use.

L. Utilities

Utility relocations and adjustments would be necessary for construction of the preferred alternative. Existing utilities within the project area are listed in Table 18. The most extensive utility relocation would involve the American Telephone and Telegraph (AT&T) fiber optic line that runs along the existing R/W on the west side of I-17 from Happy Valley Road to Anthem



Way. The portion of the line from Happy Valley Road to Carefree Highway would need to be relocated due to the acquisition of new R/W associated with constructing drainage channels and new frontage roads. Potential utility conflicts would also include telephone lines on the west side of I-17 north of Deer Valley Road, between Pinnacle Peak Road and Happy Valley Road, and on the east side of I-17 south of Carefree Highway.

Table 18 – Existing Utilities

Company	Type	Location(s)
AT&T	Fiber Optic Lines	<ul style="list-style-type: none"> From southwest quadrant of Happy Valley Road paralleling west R/W line north around the Carefree Highway TI to just north of Pioneer Road West of I-17, turning west along Anthem Way and then running north, paralleling Lake Pleasant Road to New River
APS	Underground Power Lines	<ul style="list-style-type: none"> South of SR 101L to Rose Garden Lane, approximately 110 ft west of I-17 median centerline In median from MP 227.99 to 228.22 Cross I-17 at northbound MP 227.99, southbound MP 228.22, MP 229.00, MP 229.09, MP 229.21, and MP 229.85
	Overhead Power Lines	<ul style="list-style-type: none"> Cross I-17 at Rose Garden Lane, MP 219.00, MP 219.36, MP 219.82, MP 221.50, MP 221.79, northbound MP 224.94, southbound MP 225.00, MP 225.55, northbound MP 227.24, southbound MP 227.23, northbound MP 229.29, southbound MP 229.24, MP 229.80, MP 230.00, MP 231.35, and just south of the New River Road TI
City of Phoenix	Water Lines (Abandoned)	<ul style="list-style-type: none"> West of I-17 between SR 101L and Deer Valley Road, 115 ft west of I-17 median centerline Cross I-17 at Rose Garden Lane
	Water Lines (Active)	<ul style="list-style-type: none"> From MP 215.25 to Deer Valley Road, approximately 250 ft west of I-17 median centerline Cross I-17 at MP 215.46 and 216.00
	Sewer Line	<ul style="list-style-type: none"> Crosses I-17 at MP 215.94
Cox Communications	Aerial Fiber Optic Line	<ul style="list-style-type: none"> Crosses I-17 at Rose Garden Lane
El Paso Natural Gas	Gas Pipeline	<ul style="list-style-type: none"> Crosses I-17 at MP 217.80
Southwest Gas	Gas Lines	<ul style="list-style-type: none"> Cross I-17 at MP 215.72 and 223.64
Qwest	Telephone Lines (Overhead)	<ul style="list-style-type: none"> Cross I-17 on Rose Garden Lane, and at MP 219.90 and 230.00
	Telephone Lines (Underground)	<ul style="list-style-type: none"> From MP 216.29 to 223.61 parallel to the west R/W line From MP 217.12 to 225.70 parallel to the west R/W line From MP 225.70 parallel to Lake Pleasant Road to Anthem Way, then parallel west R/W line to MP 231.35 Cross I-17 at MP 223.47, 229.05, 231.15, and 231.35

Potential conflicts with overhead power lines would occur on the west side of I-17 between MP 219.0 and 221.8, on the east side of I-17 between MP 221.8 and Carefree Highway, on the east side of I-17 between MP 219.7 and 219.8, and crossing the mainline south of Anthem Way.



In addition, power lines crossing I-17 where frontage roads would be added or relocated would likely require that the poles be relocated, including crossings near MP 218.9, 219.3, 220.0, and 221.8.

In addition, Arizona Public Service (APS) plans to construct a new 230-kilovolt transmission line that would cross I-17 at Happy Valley Road. The line would continue north abutting I-17 on the west side from Happy Valley Road to Dixileta Road, then turn northwest. APS anticipates that this line would be in service by 2008, with construction probably beginning in 2005.

ADOT's Utility and Railroad Engineering Section would investigate utility involvement during the project design phase. Potential utility conflicts would be resolved during final design of the preferred alternative. During final design, each utility company would receive and review the preliminary design for this project and develop plans for any relocations and/or adjustments. Typically, interruptions in service are minimal because the utility companies construct any new facilities before disconnecting the existing facilities. The utility companies would be responsible for notifying their customers of any anticipated interruptions in service.

M. Materials Sources and Waste Materials

The project vicinity includes a large number of materials sources that could be used for facility construction. The project would not require or designate a waste disposal site. It would be the responsibility of the construction contractor to identify any needed material sources and to provide the environmental documentation regarding the use of these sites, as specified in Section 104.12 of ADOT's Standard Specifications (ADOT 2000c).

N. Secondary Impacts

Secondary impacts are broadly defined in the Council on Environmental Quality Guidelines as "those impacts that are caused by an action and occur later in time, or are farther removed in distance but are still reasonably foreseeable after the action has been completed" (40 CFR 1508.8). Secondary impacts comprise a wide variety of effects such as changes in land use, economic vitality, and population density. Secondary impacts of the project would consist of increased traffic volumes on I-17 and continued development in the area. The new facility would improve the LOS and operational efficiency of I-17 throughout the project area due to the increased capacity provided by the widened roadway and reduced congestion in Phoenix and outlying areas. Such improvements would accommodate the continuing and planned development in the I-17 corridor.

Discussions and coordination with City of Phoenix officials, North Valley Partnership, and other planning groups revealed rapidly evolving plans for development within the study area. Based upon currently available planning information, the new Phoenix urban boundary is projected to be near Anthem Way by 2025. Extensive development is planned in the study area from Happy Valley Road to Carefree Highway as well as in the Anthem and New River areas. New and planned developments in the southern and northern portions of the study corridor are shown in Figures 4 and 5.



Future land uses would include commercial and residential development, and several residential developments have recently been completed or are currently under construction. Recent large-scale developments include:

- A large employment center, United Services Automobile Association (USAA), constructed northeast of the Happy Valley Road TI
- The KB Homes development on the west side of I-17, south of the CAP Canal
- The Tramonto development northeast of the Carefree Highway TI
- The Anthem master planned community east of I-17 along Anthem Way
- The Anthem Commerce Center southwest of the Anthem Way TI
- The Outlets at Anthem northwest of the Anthem Way TI

Based on recent new housing construction applications, the City of Phoenix anticipates that approximately 10,000 residential units have been recently completed or would be constructed within the study area over the next several years. The number of employees generated by the USAA development alone is projected to be 15,000. These new or proposed developments, along with existing development, are expected to generate substantial traffic volumes on I-17.

Additional traffic is generated by municipal and industrial uses, such as the granite mine located approximately 1.25 miles east of I-17, north of the I-17 CAP crossing. There are approximately 200 to 300 trucks per day entering and exiting the granite mine, which has an estimated remaining useful life of 40 years. Projections show that this number would increase to 500 trucks per day in the near future. Currently, these trucks access I-17 from the east frontage road and Happy Valley Road. In addition, a water treatment plant is planned within the next 10 years near the planned Dixileta Road TI, as well as a new solid waste transfer facility just northeast of the proposed treatment plant. The City of Phoenix has estimated that 2000 refuse trucks would be entering and exiting the transfer facility on a daily basis.

O. Cumulative Impacts

Cumulative impacts are defined in 40 CFR 1508.7 as “the incremental impact(s) of the action when added to other past, present, and reasonably foreseeable future actions.” For this project, cumulative effects would be related to growth and development in the general project vicinity. The preferred alternative would accommodate continued economic development in the I-17 corridor by providing a more efficient roadway for ever-increasing regional traffic volumes and increasing the potential for new development. The project area has experienced rapid development in recent years; this trend is expected to continue, as discussed on page 53. This effect would likely be intensified by the eventual construction of SR 303L, the I-17/SR 303L TI at Lone Mountain Road, and the planned TIs at Jomax Road, Dixileta Road, and Dove Valley Road. The at-risk resources identified in the project area include water resources, wildlife habitat, native plants, cultural resources, Section 4(f) resources, and visual resources. A matrix summarizing cumulative impacts in the project area is presented in Table 19.

Table 19 – Cumulative Impacts Summary

Resource	Past Actions	Present Actions	Proposed Action	Future Actions	Cumulative Effect
Cultural Resources	Development and road construction have disturbed or destroyed cultural resources sites.	Ongoing development continues to disturb or destroy cultural resources sites.	Construction of the preferred alternative would result in impacts to one prehistoric site. Data recovery would be performed prior to construction in accordance with the cultural resources PA.	Continued development would further result in disturbance or destruction of cultural resources.	Reduction in the number and variety of cultural resources.
Native Plants	Development and road construction have resulted in the removal of protected native plants.	Ongoing development continues to result in the removal of protected native plants.	Construction of the preferred alternative would result in impacts to protected native plants. Approximately 60 saguaros would be salvaged and transplanted, and other protected native plant species would be salvaged and transplanted, as determined during final design.	Continued development would further result in the removal of protected native plants.	Reduction in native plants and biological diversity within the project area.
Section 4(f) Resources	Sun-Up Ranch listed on NRHP under criterion ‘a.’	Increasing traffic and congestion along I-17 adjacent to the property. Increasing pressure to delist and subdivide the property to facilitate development.	Construction of the preferred alternative would require acquisition of 0.7 acres of new R/W from the ranch but would not affect any contributing elements of the site.	Potential delisting of the property by the owner and subsequent development.	Reduction in the number and variety of Section 4(f) resources.
Visual Resources	Construction of highway, utilities, and development have detracted from the natural setting.	Ongoing development continues to detract from the natural setting and increase the urban feel of the visual environment.	Construction of the preferred alternative would have impacts on the visual quality of the project area due to construction of retaining walls and noise barriers, addition of lanes, and widening of structures.	Continued development would further detract from the natural setting and increase the urban feel of the visual environment.	Gradual shift of the visual environment from rural to urban.
Water Resources	Road construction and development have resulted in the placement of fill within jurisdictional waters, impacts to the 100-year floodplain, and increased runoff due to impervious surfaces.	Ongoing development continues to result in the placement of fill within jurisdictional waters, impacts to the 100-year floodplain, and increased runoff due to impervious surfaces.	Construction of the preferred alternative would result in impacts to 16 washes, the placement of fill within 1.66 acres of jurisdictional waters, impacts to the 100-year floodplain in five locations, and increased runoff due to the wider pavement surface.	Continued development would further result in the placement of fill within jurisdictional waters, impacts to the 100-year floodplain, and increased runoff due to impervious surfaces.	Potential decrease in water quality due to sedimentation, increased turbidity, and reduction of natural and beneficial floodplain values.
Wildlife Habitat	Highway and utility corridors have intersected wildlife habitat, restricting wildlife movements. Development has reduced or degraded available habitat.	Ongoing development continues to reduce or degrade available habitat.	Construction of the preferred alternative would create a wider roadway for wildlife to cross and reduce or degrade available habitat.	Continued development would further reduce or degrade available habitat.	Reduction and degradation of available habitat and reduced biological diversity.

